

Equipment List

Tools and Equipment Heavy Equipment Operations Program

The tool lists are organized into three basic categories: *Hand Tools*, *General Lab/Shop Equipment*, and *Specialty Tools and Equipment*. The specialty tools section is further separated into the eight NATEF task categories. When referring to the tools and equipment list, **please note** the following:

1. The organization of the tool list is not intended to dictate how a program organizes its tool crib or student tool sets (i.e., which tools should be in a student set, if utilized, and which should be in the tool crib or shop area).
2. Quantities for each tool or piece of equipment are determined by the program needs; however, sufficient quantities to provide quality instruction should be on hand.
3. Programs may meet the equipment requirements by borrowing special *equipment or providing for* off-site instruction (e.g., in a dealership or independent repair shop). Use of borrowed or off-site equipment *must* be appropriately documented.
4. No specific brand names for tools and equipment are specified or required.
5. Although the NATEF Standards recommend that programs encourage their students to begin to build their own individual tools sets prior to entry into the industry, there is no requirement to do so. NOTE: Industry surveys indicate that most (90%) employers require that a candidate for employment provide his/her own basic hand tool set in order to be hired as an entry-level automobile technician.

Hand Tools (contained in individual sets or tool crib in sufficient quantities to permit efficient instruction)

Hex Key Wrench Set - Standard

- (.050" - 3/8")
- (7/16" - 1/2" optional)

Hex Key Wrench Set - Metric (2mm - 12mm)

Stud-to-Post or Charging/Test Adapter

Chisels - Cold

- 5/8"
- 3/4"

Combination Wrenches

- Standard (3/8" - 1") (up to 1 and 1/4" optional)
- Metric (6mm - 19mm) (up to 24mm optional)

Digital Multimeter - minimum 10 meg. ohms impedance

Electrical Pliers - Crimper/Stripper

Files and Handles

- 12" Fine
- 12" Coarse
- 12" Half Round

Equipment List

Hand Tools (cont'd)

Flare Nut Wrench Set

- Standard (3/8" - 3/4")
- Metric (7mm - 19mm)

Flashlight

Goggles - (per OSHA requirements)

Hack Saw

Hammers

- Ball Peen - 16 oz. and 24 oz.
- Soft Face

Hearing Protection - (per OSHA requirements)

Inspection Mirror

Magnetic Pickup Tool

Mechanic's Steel Ruler - Machinist Rule

Pliers - Adjustable Joint

- Locking Pliers
- Needle Nose
- Side Cutters
- Slip-joint

Punches

- Pin 3/16" - 3/8"
- Starter 3/16" - 3/8"
- Aligning Punch Set
- Brass punch
- Center punch

Safety Glasses (Side Panels) - (per OSHA requirements)

Scraper - 1" wide or larger

Screwdriver - Blade Type:

- 1"
- 6"
- 9"
- 12"

Equipment List

Hand Tools (cont'd)

Offset

Screwdriver - Phillips:

- 1" #2
- 6" #1, #2
- 12" #3

Socket Set - 1/4" Drive:

- 3/16" - 1/2" U.S. Standard Depth
- 3/16" - 1/2" U.S. Deep
- 4mm -13mm Metric Standard Depth
- 4mm -13mm Metric Deep
- Extensions - Short, Medium, and Long
- Ratchet Handle
- Universal Joint

Socket Set - 3/8" Drive:

- 3/8" - 3/4" U.S. Standard Depth (12 point), Impact or Chrome
- 3/8" - 3/4" U.S. Deep (6 point), Impact or Chrome
- 10mm - 19mm Metric Standard Depth (6 point), Impact or Chrome
- 10mm - 19mm Metric Deep (6 point), Impact or Chrome
- Extensions- Short, Medium, and Long
- Ratchet Handle
- Universal Joint

Socket Set - 1/2" Drive: 1/2" – 1 1/8" Shallow, Impact or Chrome

- 7/16" – 1 1/8" Deep, Impact or Chrome
- 13mm - 32mm Shallow, Impact or Chrome
- 13mm - 32mm Deep, Impact or Chrome
- Breaker Bar
- Extensions - Short, Medium, and Long
- Ratchet Handle
- Universal Joint

Tape Measure (25')

Tire Tread Depth Gauge

Tire Pressure Gauge - Truck

Tool Box

Wire Brush

Equipment List

General Lab/Shop Equipment

The tools and equipment on this list are used in general lab/shop work, but are not generally considered to be individually owned hand tools. A well equipped, certified program should have all of these general tools and equipment readily available and in sufficient quantity to provide quality instruction.

Adjustable Wrenches - (up to 18")

Air Blow Gun - Rubber Tip (per OSHA requirements)

Air Ratchet Wrench

- 3/8" Drive with Impact Socket Set

- Standard and Metric

Back Support Belt

Belt Tension Gauge

Bushing Driver Set

C-Clamps

Cleaning Tank

Combination Wrench Set

- 3/8" – 1 1/2" and 6mm - 24mm

- 3/8" - 3/4" Offset (optional)

- 7mm - 15mm Offset (optional)

Coolant Conditioner Test Kit (Test Strips)

Cooling System Pressure Tester

Creepers

Diagnostic Information Reader

- PC with appropriate software

- and/or internet-access drive for reading electronic service information

Diagnostic Tool - PC or Data Scan Tool with appropriate software

Dial or Digital Caliper - Standard and Metric

Dial Indicator Set - Magnetic Base

Drain Pans

Drill

- 3/8" variable speed, reversible

- 1/2" variable speed, reversible

Drill Bits

- 1/16"

- 1/2"

Extractor Set (broken bolt)

Equipment List

General Lab/Shop Equipment (Cont'd)

Face Shield

Feeler Gauge - Blade Type:

→ .005" - .050"

→ .005mm - .070mm

Filter Wrenches - Small and Large

Fin Comb

Floor Jack - (10 Ton)

Funnels

Gear Oil Dispenser

Grease Gun

Grinder – Bench

Hammers

→ 48 oz. Ball Peen

→ 24 oz. Brass

→ 12 lb. Hand Sledge

Hand Held Infrared

Thermometer

Hand Impact Driver Set

Heat Gun

Hydraulic Press - (minimum 20 ton)

Impact Wrenches –

→ 1/2" Drive with Impact Sockets

→ 3/4" Drive with Impact Sockets

→ 1" Drive with Impact Sockets

Impact Universal Joints - 3/8", 1/2"

Jacks - (Bottle Style)

Lifting Chains

Lifting Eyes

Master Tire Gauge - for tire gauge calibration checks

Micrometer Set

→ Standard (0" - 6")

→ Metric (0mm - 150mm)

Micrometer

→ Inside (0" - 6")

→ Depth Micrometer (0" - 6")

Equipment List

General Lab/Shop Equipment (Cont'd)

Oxy - Acetylene Torch Set

Pipe Wrenches (up to 18" or 24")

Pliers - Snap Ring

→ Internal

→ External

→ Wheel Weight

Portable Crane

Pressure Gauge - (0 - 300 psi), (0 - 3000 psi)

Pry Bar Set

Pullers

→ Two Jaw Set

→ Three Jaw Set

Refractometer - (Antifreeze Tester or Test Strips)

Safety (Jack) Stands - (minimum 10 ton)

Seal Puller

Socket Set - 3/4" Drive

Socket Set: Hex Key Drivers:

→ Standard 3/16" - 3/4"

→ Metric 4mm - 19mm

→ Axle Nut Sockets

→ Crows Feet: Standard and Metric

→ Inverted Torx Socket Set: E-15 - E-55

→ Torx® Drivers: T-15 - T-55

Soldering Gun

Tap and Die Set - Standard and Metric

Thread Chaser Set

Tire Cage

Tire Chuck – Truck

Torque Angle Gauge

Torque Multiplier with Adapters (optional)

Torque Wrenches

→ 3/8" Drive (0 - 150 lb. in.)

→ (0 - 100 lb. ft.)

→ 1/2" Drive (0 - 250 lb. ft.)

→ 3/4" Drive (up to 600 lb. ft.)

Equipment List

General Lab/Shop Equipment (Cont'd)

Tubing Cutter/Flaring Set

Valve Core Replacement Tool (Tire)

Wheel Chocks

Wheel Dolly

Wheel Socket Set

Specialty Tools and Equipment

This section covers the tools and equipment a lab/shop should have for training in any given specialty area. This equipment is specialized and it must be available in the lab/shop. No specific type or brand names are identified because they will vary in each local situation.

Please note: All shops are assumed to have an air compressor, air hoses, adequate electrical capability, fender covers, seat covers, and work benches with vises.

Suspension and Steering

Air Hammer with Chisels

Alignment Equipment: Minimum to perform tasks (including tandem alignment)

Flow Meter - Power Steering

Pitman Arm Puller

Tape Measure (50')

Wheel Balancer

Tire Machine

Brakes

Bearing Packer (optional)

Bearing Race Installer

Brake Bleeder

Brake Fluid Tester or Test Strips

Brake Lining Thickness Gauge

Brake Rotor (Disc) Micrometer

Brake Spring Tool

Disc Caliper Tool for Compressing Caliper Pistons

Drum Brake Gauge

Method for removing asbestos contamination (Parts Cleaner) meeting EPA Standards

Seal Installers

Brake Lathe

Slack Adjuster Installation Index Tool (Templates)

Equipment List

Heating, Ventilation, and Air Conditioning

A/C Compressor Clutch Pullers

Gloves

Halogen Leak Detector (for HFCs)*

Heater Hose Clamp-Off Tool

Manifold Gauge Set*

Measuring Cup

Micron Meter (Electronic Vacuum Gauge) – (optional)

Orifice Tube Remover

Portable Vacuum Pump (maybe included with Recovery/Recycling/Recharging Station Equipment)

Recovery/Recharging and/or Recycling Station*

Spring Lock Coupler Removers

Thermometer

Valve Core (Shrader Type) Replacement Tool

*Meeting EPA Regulations and SAE “J” Standards

Drive Train

3/4" Drive Pinion Nut Sockets

Aligning Studs

→ 3/8"

→ 1/2"

→ & 5/8"

Axle Shaft Removal Tool

Blind Hole/Pilot Bearing Puller

Clutch Adjusting Tools (Pull Type)

Clutch Disc Aligning Tool

Clutch Jack and/or Transmission Jack Attachments

Protractor (Angle Gauge)

Transmission Jack

→ U-Joint Puller

→ Yoke Puller

Equipment List

Electrical/Electronic Systems

Battery Charger (200 AMP Minimum)
Battery Terminal Adapters
Die Type Terminal Crimper (optional)
Capacitance Battery Tester
GMM Labscope or DMM with scope capability
Inductive (Clamp-on) Ammeter
Jumper Cable Set (Heavy-Duty)
Load Tester - Starting, Charging, and Battery (1,000 AMP Minimum)
Low AMP Automatic Charger or equivalent device to maintain shop batteries.
Test Lead Kit
Terminal Repair Kits

Engine Tools

Ball/Small Hole Gauges
Cooling System Vacuum Fill Machine (optional) Dial Bore Gauge or Telescoping Gauges
Engine Stands
Fan Hub Wrenches
Injector Removal Tool(s)
Liner Installer (universal)
Liner Puller (universal)
Manometer - (Water) or Magnehelic Gauge
Precision Straight Edge
Protrusion Gauge (Cylinder Liner Height)
Ring Compressor
Ring Expander(s)
Rod Bolt Protectors
Soft Jaw Vise or Adapters
Valve Spring Compressor
Vibration Damper Puller
Work Stand/Step (Used for Tall Vehicles)

Preventive Maintenance Tools

Fifth Wheel Test Pin
Stop Watch
Tire Square
Trailer Cord Tester

Equipment List

Hydraulics Tools

Pressure/Flow Meter

1000 PSI Liquid Filled or Electronic Gauge and Hose Assembly

5000 PSI Liquid Filled or Electronic Gauge and Hose Assembly

Thermometer (up to 250 degrees) Standard or Infrared

Hose Crimper Tool and Pump (either air over hydraulic or hand pump)-(optional)

Fittings and adapters for specific applications